Bull. Mus. natn. Hist. nat., Paris, 4e sér., **9**, 1987,
section B, *Adansonia*, n° 1 : 95-100.

Two new species of *Nesogordonia* (*Sterculiaceae*) from Madagascar

L. C. Barnett

Summary : *Nesogordonia abrahamii* L. Barnett and *N. pachyneura* Capuron ex L. Barnett (*Sterculiaceae*) are described from Madagascar.

Résumé : *Nesogordonia abrahamii* L. Barnett et *N. pachyneura* Capuron ex L. Barnett (*Sterculiaceae*) sont décrits de Madagascar.

Lisa C. Barnett, Department of Botany, University of Texas at Austin, Austin, Texas 78713-7640, U.S.A.

The genus *Nesogordonia* Baillon (*Sterculiaceae*) comprises eighteen species of forest trees of the Old World tropics. Fifteen species, of which two are described here, are endemic to Madagascar. African species were known originally under the name *Cistanthera* Schumann until Capuron (1952) recognized that *Cistanthera* was indistinguishable from the Malagasy genus *Nesogordonia*. All *Nesogordonia* species are recognized readily by their fruit : a turbinate, woody, loculicidal capsule bearing winged seeds. The characteristic fruit and seed morphologies have been the principal basis for associating *Nesogordonia* with the *Helmiopsideae* Arènes, a tribe consisting of two other genera, *Helmiopsis* Perrier (8 species) and *Helmiopsiella* Arènes (4 species), both of which are restricted to Madagascar. Species of *Nesogordonia* are distinguished from the other members of the *Helmiopsideae* by several features, including fleshy petals and staminodes ; laminar stamens in five separate fascicles that are free from the staminodes ; subapical placentae ; five connate styles ; stigmas fleshy and conical with a recurved stigmatic surface ; seeds with inferior wings ; entire, conduplicate cotyledons ; and reticulate pollen.

Herbarium studies at the Muséum National d'Histoire Naturelle in Paris (P), and the Herbier des Eaux et Forêts in Antananarivo, Madagascar (TEF), allowed the author to discover material of two new species of *Nesogordonia* while preparing a monograph of the genus.

Nesogordonia abrahamii L. Barnett, *sp. nov.*

Arbor foliis obovatis, 1.5-5 cm longis, 1.3-3 cm latis, domatiis axillaribus ; inflorescentiis 1-2-floribus ; petalis 13-15 mm longis, 8-10 mm latis ; staminibus fertilibus 20, staminibus exterius 15 in fasciculis 5 dispositis, staminibus interior 5 liberis, staminodiis nullis.

Type : *Service Forestier 26864 SF* (holo-, P ; iso-, TEF).

Tree 10-15 m tall with straight, narrow bole ; young shoots tan, finely striate, densely stellate-pubescent, in age twigs glabrate, gray, bark wrinkled and knobby with prominent leaf scars. Leaves obovate, 1.7-4.8 cm long, 1.3-3 cm wide, base rounded, apex mucronate and truncate to retuse, margins entire, slightly undulate and revolute toward the apex, mid-vein and secondary veins raised below, lower surface of blades densely golden-brown stellate-pubescent, bearing domatia of long-armed stellate hairs in the axils of midrib and secondary veins, upper surface of blades sparsely stellate-pubescent. Petioles 3-7 mm long, stellate-pubescent. Stipules fugacious.

Inflorescences axillary, 1-2-flowered ; peduncles 20-35 mm long, densely stellate-pubescent, articulated 2-8 mm below the flower. Floral buds ovate, 13-14 mm long, 8-9 mm wide, densely stellate-pubescent. Calyx 5-lobed, united only at the base, lobes narrowly-elliptic, 13-17 mm long, 8-10 mm wide. Petals 5, obovate, 13-15 mm long, 8-10 mm wide. Stamens 20, external stamens 15 in fascicles of 3, internal stamens 5, free, laminar, 9-12 mm long ; anthers linear, 7-9 mm long. Pistil tomentose ; ovary 5-costulate, 2-3 mm tall, 3-4 mm wide ; styles 5, connate, 2-3 mm long ; stigma lobes 5, fleshy, 2-3.5 mm long.

Capsules woody, brown, densely stellate-pubescent, obconic, costulate toward the base, 35-46 mm long, 20-30 mm wide ; apex deeply concave, rim raised, either indistinct and rounded or well-defined and angular. Seeds 7-11 × 4-5 mm, seed-wings 12-20 × 8-9 mm.

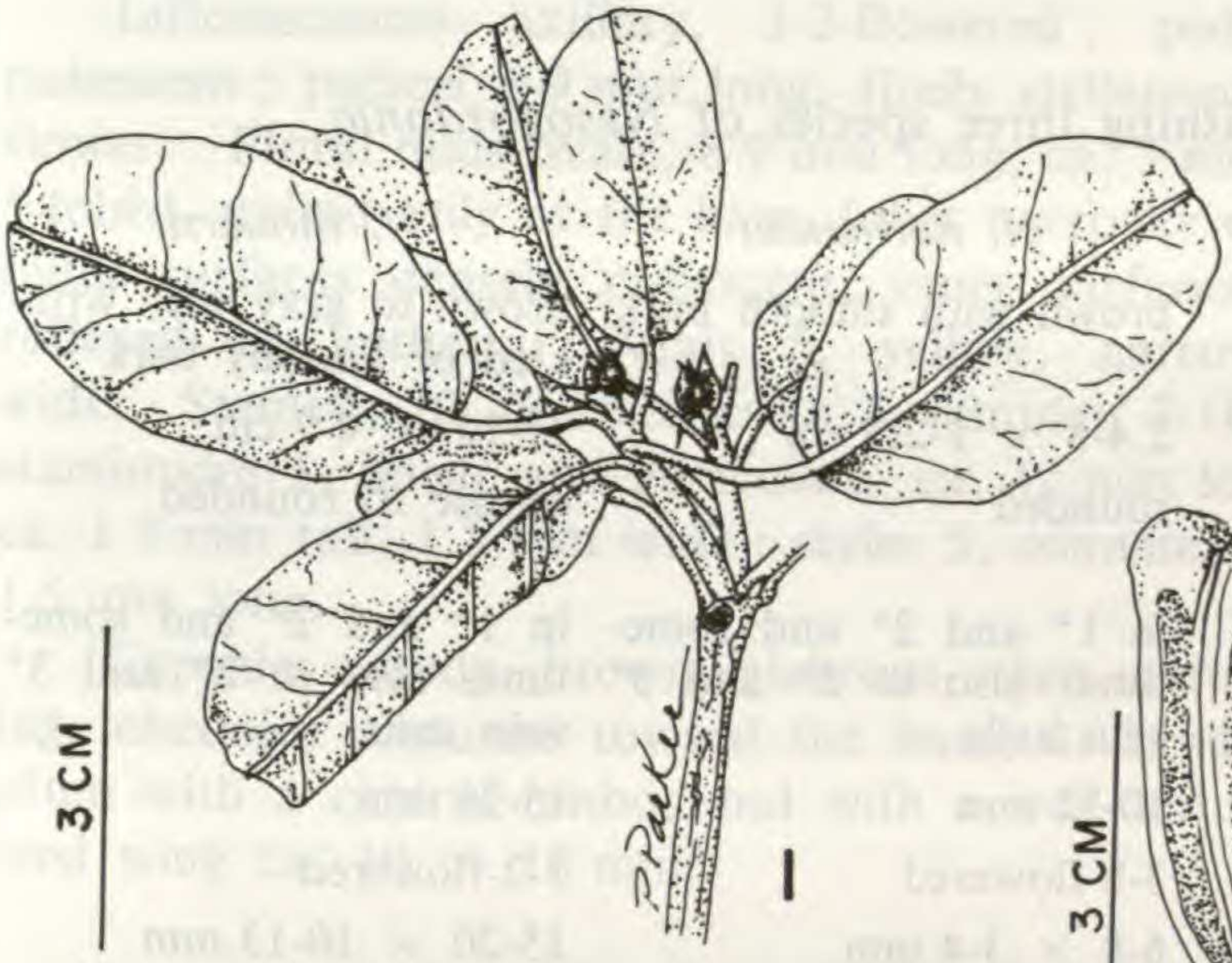
Nesogordonia abrahamii is unusual in bearing an internal whorl of 5 fertile stamens rather than an internal ring of 5 staminodes. Although this internal fertile whorl is a feature of only two other *Nesogordonia* species, *N. fertilis* Perrier and *N. ambalabeensis* Arènes, this fact should not be interpreted as evidence of close relationship among these three taxa.

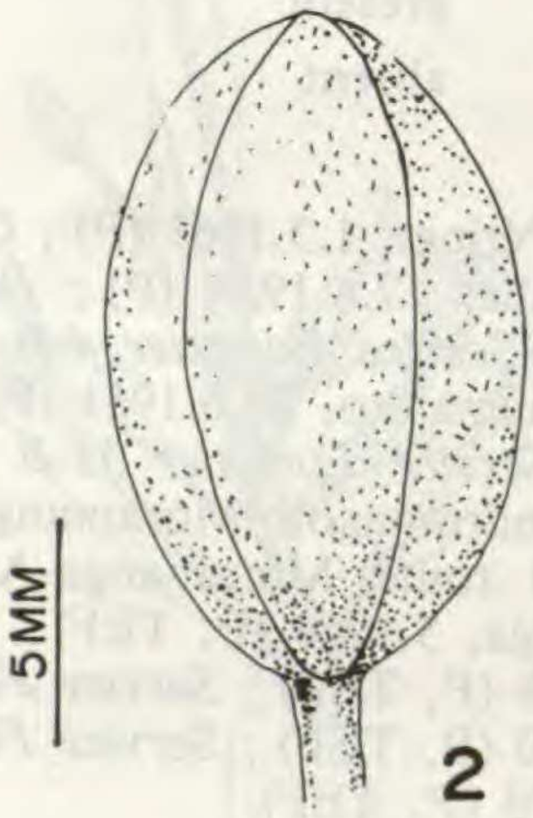
Nesogordonia abrahamii seems to be most closely related to *N. thouarsii* (Baillon) Capuron. The two species share prominent and evenly-parallel secondary venation ; very conspicuous domatia ; short, stout petioles ; large flowers with ovate, coriaceous petals ; wrinkled, knobby, or gnarled bark on the twigs ; flowers solitary or paired ; and a variable capsule morphology that is, in general, concave at the apex with a raised and usually rounded rim. *Nesogordonia abrahamii* differs primarily in its much smaller leaves, absence of staminodes, and well-developed seed wing. (The seed wing of *N. thouarsii* is reduced, presumably an adaptation to water dispersal in the seasonally-flooded habitat of this species.)

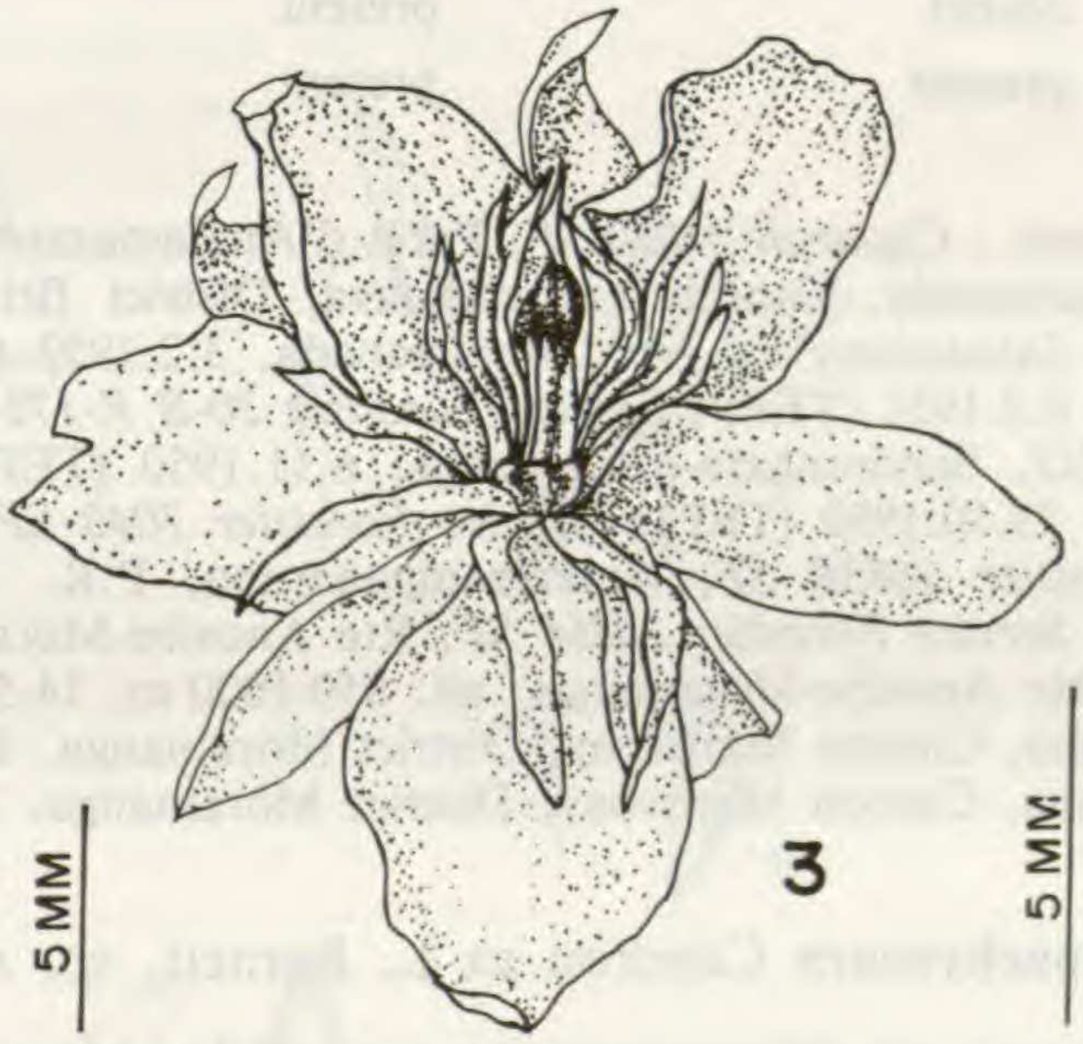
Nesogordonia abrahamii had remained undescribed largely because it bears a superficial resemblance to *N. normandii* Capuron in terms of leaf size, shape, and pubescence, and has been consistently confused with that species. *Nesogordonia abrahamii, N. normandii*, and *N. thouarsii* can be differentiated readily on the basis of the characters listed in Table 1.

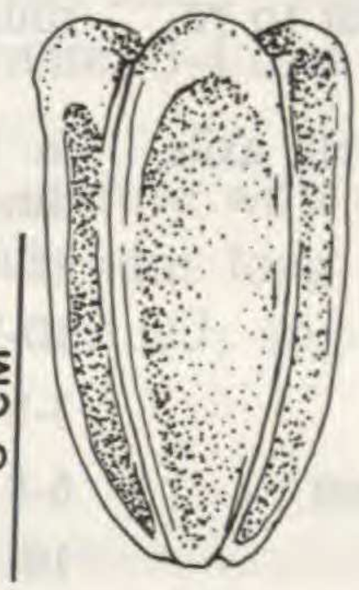
Nesogordonia abrahamii is restricted largely to moist, tropical forest of central-eastern Madagascar at approximately 1,000 m elevation, along the escarpment between the central plateau and the eastern coast.

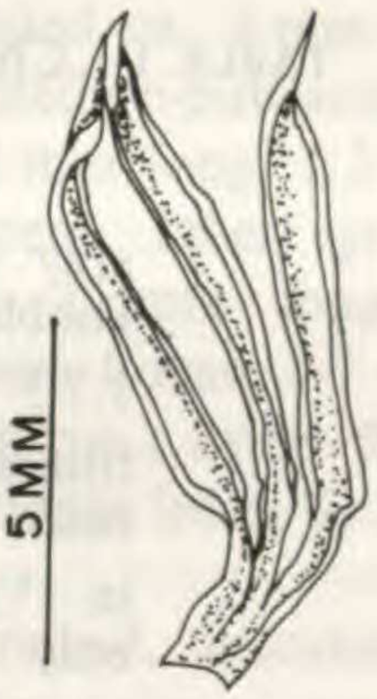
The specific epithet honors Jean-Prospèr ABRAHAM, a botanist whose field expertise has contributed significantly to the knowledge of Malagasy plants.

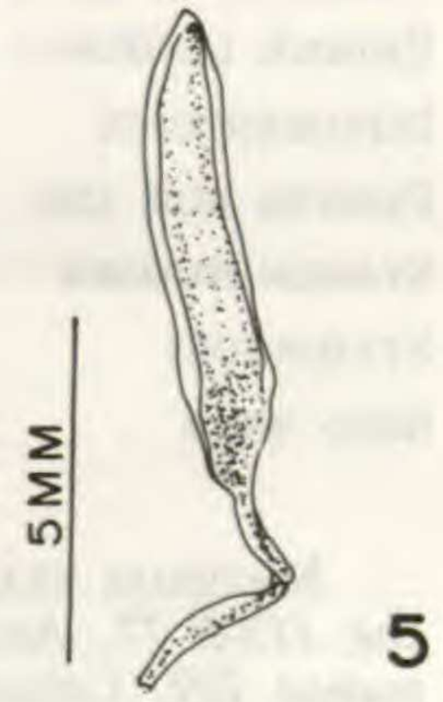












Pl. 1. — **Nesogordonia abrahamii** L. Barnett : **1**, twig ; **2**, floral bud ; **3**, flower at anthesis ; **4**, fascicle of 3 outer stamens ; **5**, inner stamen ; **6**, gynoecium ; **7**, capsule. (1, *Service Forestier 20-B R-172*, P ; 2-6, *Service Forestier 26864 SF*, TEF ; 7, *Service Forestier 26838 SF*, P).

Common names for this species are generalized. However, the following names have been reported by various collectors : Fanondambo (*Randriamanga 139* ; *Service Forestier 26838 SF, 26864 SF, 26865 SF, 26924 SF, 26947 SF*) ; Mantaly (*Goyeniche 115-R-77*) ; Menavahatra- « red shrub » (*Service Forestier 29-R-212*) ; Tavia- « tree » (*Service Forestier 20-B R-172, 53-B R-172*).

TABLE 1 : Characters distinguishing three species of *Nesogordonia*.

	N. abrahamii	*N. normandii*	*N. thouarsii*
TWIGS	gray with wrinkled or knobby bark	brown with smooth bark	brown to gray with wrinkled or knobby bark
LEAF SIZE	1.7-5 × 1.3-3 cm	2.4-5 × 1-2.5 cm	11-20 × 4-7 cm
LEAF APEX	truncate and flat to retuse	rounded	obtuse to rounded
DOMATIA	in 1° and 2° vein axils only	in 1° and 2° and sometimes also in 2° and 3° vein axils	in 1° and 2° and sometimes also in 2° and 3° vein axils
PETIOLE LENGTH	3-7 mm	10-22 mm	15-20 mm
INFLORESCENCE	1-2-flowered	3-8-flowered	1-2-flowered
FLOWER BUD SIZE	13-14 × 8-9 mm	6-8 × 3-4 mm	15-20 × 10-13 mm
STAMEN NUMBER	20	10	15-20
STAMINODES	absent	present	present
SEED WING	present	present	absent

MATERIAL EXAMINED : *Capuron 24020 SF*, Forêt d'Analamazaotra, Périnet, 1.3.1965 (P) ; *Goyeniche 115-R-77*, Andriantantely, Canton Lohariandava, District Brickaville, 17.6.1954 (P) ; *Randriamanga 139*, Lohan'i Sahatenany au Nord de Beanana, 3.2.1952 (P) ; *Service Forestier 4-B R-172*, Sahamaloto, Périnet, 8.2.1951 (TEF) ; *Service Forestier 20-B R-172*, Sahamaloto, 22.6.1951 (P) ; *Service Forestier 29-R-212*, Sandrangato-Moramanga, 6.11.1950 (TEF) ; *Service Forestier 53-B R-172*, Sahamaloto, Périnet, 23.10.1950 (TEF) ; *Service Forestier 7040 SF*, Sandromagoto-Moramanga, s.d. (TEF) ; *Service Forestier 26838 SF*, Antetezampandrana, P.K. 27-28 route Moramanga-Anosibe, 10.1.1969 (P, TEF) ; *Service Forestier 26864 SF*, Rte Anosibe-Moramanga, 5.1969 (P, TEF) ; *Service Forestier 26865 SF*, Rte Anosibe-Moramanga, alt. 950-1000 m, 14.5.1969 (P, TEF) ; *Service Forestier 26924 SF*, Nangaranana, Canton Marovoay, District Moramanga, 1.1970 (P, TEF) ; *Service Forestier 26947 SF*, Nangaranana, Canton Marovoay, District Moramanga, 2.1970 (P, TEF).

Nesogordonia pachyneura Capuron ex L. Barnett, *sp. nov.*

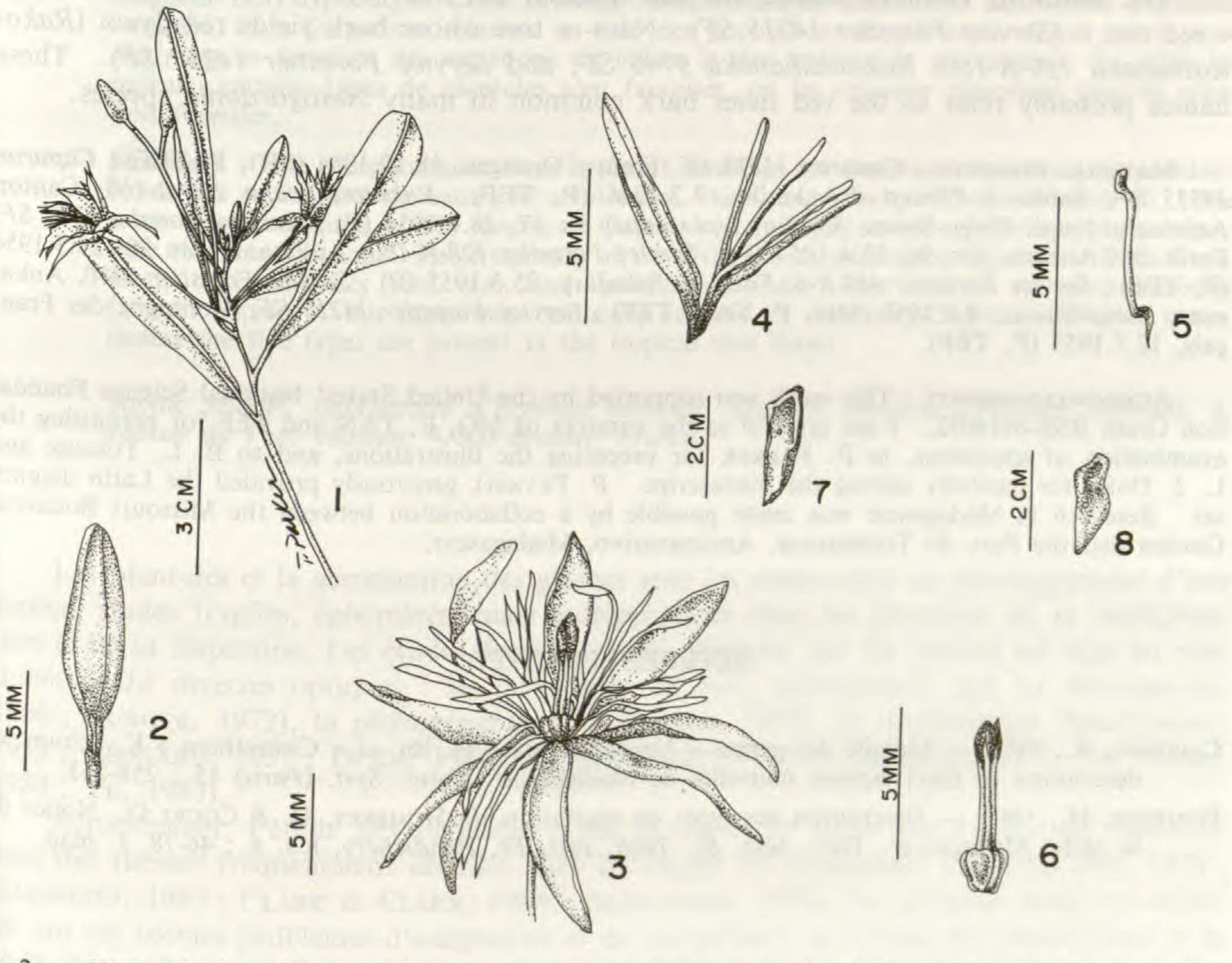
Arbor, foliis obovatis vel oblanceolatis, 2.3-5 cm longis, 1-2 cm latis, costa crassissima ; inflorescentiis 1-2-floribus ; petalis ca. 11 mm longis, 1-2 mm latis ; staminibus fertilibus 20, in fasciculis 5 dispositis, staminodiis 5.

TYPE : *Capuron 24535 SF* (holo-, P ; iso-, TEF).

Tree 7-18 m, trunk diameter to 40 cm ; young shoots tan, densely stellate-pubescent, glabrate with age, older twigs tan to gray, bark striate to wrinkled. Leaves obovate to oblanceolate, 2.3-5 cm long, 1-1.7 cm wide, base attenuate, apex mucronulate, truncate and retuse or obtuse or rounded, margins entire to slightly undulate and slightly revolute, midvein thickened and very prominently raised below, slightly raised above, lower surface of blades glabrate or stellate-pubescent, especially in the axils of the midvein and secondary veins, upper surface of blades glabrate. Petioles 3-8 mm long, minutely stellate-pubescent to glabrate. Stipules narrowly triangular, ca. 3 mm long, fugacious.

Inflorescences axillary, 1-2-flowered ; peduncle 16-21 mm long, finely stellate-pubescent ; pedicel 6-9 mm long, finely stellate-pubescent, articulated ca. 2 mm below the flower. Floral buds ovate, 8-9 mm long, ca. 3 mm wide, densely stellate-pubescent. Calyx 5-lobed, united only at the base, lobes narrowly elliptic, ca. 11-12 mm long, 1-2 mm wide, outer surfaces densely pubescent, inner surfaces sparsely pubescent, lobes spreading or reflexed at anthesis. Petals 5, yellow, narrowly elliptic, ca. 11 mm long, 1-2 mm wide. Stamens 20, in fascicles of 4, laminar, 7-10 mm long ; anthers linear, 5-7 mm long ; staminodes 5, linear and geniculate, ca. 12 mm long. Pistil tomentose ; ovary 5-costulate, ca. 1.5 mm tall, 1.5 mm wide ; styles 5, connate, 3-4 mm long ; stigma lobes 5, fleshy, ca. 1.5 mm long.

Capsules woody, brown, glabrous when mature with a faint, raised, reticulate patterning, obconic, costulate toward the base, 21-25 mm long, 17-24 mm wide ; apex concave, often with a central umbo, and with a well-defined, angular rim. Seeds ca. 8 × 4 mm, seed wing ca. 10 × 16 mm.



Pl. 2. — **Nesogordonia pachyneura** Capuron ex L. Barnett : **1**, twig in flower ; **2**, floral bud ; **3**, flower at anthesis ; **4**, fascicle of 4 stamens adnate to a petal ; **5**, staminode ; **6**, gynoecium ; **7**, single carpel of the fruit ; **8**, winged seed. (1-6, *Capuron 24535 SF*, P ; 7, 8, *Capuron 11326 SF*, MO).

Nesogordonia pachyneura is closely allied with *N. bernieri* Baillon, with which it shares small, glabrescent leaves ; inconspicuous secondary venation ; 1-2-flowered inflorescences ; chartaceous petals ; and a capsule that is sharply rimmed at the apex. *Nesogordonia pachyneura* is distinguished by its prominently-swollen midvein raised both above and below the lamina ; 20 stamens ; large flowers (over 1 cm in length) ; and narrow petals.

Nesogordonia pachyneura is found in the northern sector of HUMBERT's (1965) Domaine de l'Ouest. It occurs from 150-350 m altitude and has been collected in forest both on limestone (somewhat unusual for the genus), and on sand (the more typical substrate of *Nesogordonia* species).

The specific epithet, *pachyneura*, emphasizes the enlarged midvein characteristic of this species. CAPURON had annotated several specimens of this new species, although his untimely death did not allow him to publish the name.

The following common names are non-specific, but have been reported : Hazomena- « red tree » (*Service Forestier 14215 SF*) ; Nato- « tree whose bark yields red dye » (*Rakotosihanaka 139-R-160, Rakotosihanaka 9746 SF*, and *Service Forestier 14215 SF*). These names probably refer to the red inner bark common in many *Nesogordonia* species.

MATERIAL EXAMINED : *Capuron 11326 SF*, Forêt d'Orangea, 18.10.1954 (MO, P, TEF) ; *Capuron 24535 SF*, Sables à l'Ouest d'Ankerika, 7.2.1966 (P, TEF) ; *Rakotosihanaka 139-R-160*, Canton Anivorano-Nord, Diégo-Suarez J(ardin) B(otanique) 8 : 17, 28.7.1954 (P) ; *Rakotosihanaka 9746 SF*, Forêt de l'Ankara, Km 96, 13.4.1954 (P) ; *Service Forestier 128-R-160*, Ankarana, Km 96, 25.5.1954 (P, TEF) ; *Service Forestier 449-R-6*, Forêt de Sahafary, 25.3.1955 (P) ; *Service Forestier 5440*, Ankarana, Diégo-Suarez, 8.8.1952 (MO, P, TAN, TEF) ; *Service Forestier 14215 SF*, Montagne des Français, 12.7.1955 (P, TEF).

ACKNOWLEDGEMENTS : This work was supported by the United States' National Science Foundation Grant BSR-8414032. I am grateful to the curators of MO, P, TAN and TEF for permitting the examination of specimens, to P. PARKER for preparing the illustrations, and to B. L. TURNER and L. J. DORR for carefully editing the manuscript. P. FRYXELL generously provided the Latin diagnoses. Research in Madagascar was made possible by a collaboration between the Missouri Botanical Garden and the Parc de Tsimbazaza, Antananarivo, Madagascar.

REFERENCES CITED

CAPURON, R., 1952. — Identité des genres « Nesogordonia » H. Bn. et « Cistanthera » K. Schum. et description de deux espèces nouvelles de Madagascar. *Notul. Syst.* (*Paris*) 15 : 258-263.

HUMBERT, H., 1965. — Description des types de végétation. *In* HUMBERT, H. & COURS G., Notice de la carte, Madagascar. *Trav. Sect. Sc. Tech. Inst. Fr. Pondichery*, h.s. 6 : 46-78 + map.